

## **REMARKS**

### **Foreign Priority**

The acknowledgement, in the Office Action, of a claim for foreign priority under 35 U.S.C. § 119(a)-(d), and that the certified copy of the priority document has been received, is noted with appreciation.

### **Status Of Application**

Claims 1-21 are pending in the application; the status of the claims is as follows:

Claims 4-6 and 10-18 are rejected under 35 U.S.C. § 102(b) as being fully anticipated by U.S. Patent No. 4,725,511 to Reber (hereinafter the "Reber Patent").

Claims 1-3, 7-9 and 19-21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Reber Patent, in view of U.S. Patent No. 5,370,768 to Mersereau et al. (hereinafter the "Mersereau Patent").

### **Drawings**

To date, no Notice of Draftsperson's Patent Drawing Review has been received. Applicant respectfully requests receipt of this document when it becomes available. Please note that the original drawings filed in the patent application are "formal" drawings.

### **Claim Amendments**

Claims 1, 7, and 19 have been amended to more accurately and appropriately claim the claimed invention. These changes are not necessitated by the prior art, are unrelated to the patentability of the invention over the prior art, and do not introduce any new matter.

**Substitute Specification**

The Specification is objected to by the Examiner.

The Applicant respectfully asserts that the original specification meets all requirements of 37 C.F.R. §1.52 and MPEP § 608.01, including typeface, font size, and line spacing. However, in order to assist the Examiner, Applicant submits a Substitute Specification which increases the line spacing from 1-½ to double spaced. Also, as the paragraphs of the specification are numbered, Applicant has removed the unnecessary and inadvertently included line numbers.

**35 U.S.C. § 102(b) Rejection**

The rejection of claims 4-6 and 10-18 under 35 U.S.C. § 102(b) as being fully anticipated by the Reber Patent, is respectfully traversed based on the following.

Claim 4 is directed to a method of manufacturing an optical device having a first layer functioning as an optical waveguide layer and a second layer functioning as a base layer, and requires the steps of:

providing a resist layer on a surface of a first medium;  
removing portions of the resist layer to form vacancies;  
removing portions of the first medium corresponding to the  
vacancies to create cavities in the first medium, the depth of the cavities  
being less than a thickness of the first medium;  
removing the resist layer completely;  
filling the cavities in the first medium with a second medium; and  
**removing any excess film of the second medium from the  
surface of the first medium.** (Emphasis added)

The Reber patent is directed to a method of etching designs in a watchface. According to the Reber patent, the decorative material used to form the design comprises: "a semiconductor substrate (10), at least one patterned coating (14) formed on one major surface (12) of the substrate and a transparent layer (28) formed thereover." *See* Abstract. Specifically with reference to Figs. 1a-1d, a resist layer (20) is applied on the at least one patterned coating (14). Openings (22) are formed through the resist layer (20) and the

patterned coating (14) to expose either the patterned coating or the semiconductor substrate (10). The resist layer (20) is then removed, and a transparent top coating layer (28) is filled into the openings (22) and applied as a protective coating to a thickness of between 1 and 3 micrometers upon a surface of the patterned coating (14). That is, the transparent layer (28) completely fills the openings (22) and **completely coats** the patterned coating (14) such that none of the patterned coating (14) is exposed. In discussing the necessity and effect of the transparent layer, the Reber patent states that at a "thickness of substantially less than about 1 micrometer, the layer will not adequately protect the underlying coating, while at thicknesses substantially greater than about 3 micrometers, the layer would craze, which would tend to destroy the aesthetic effect of the final product." Col. 6, lines 10-16. The excess of the top coating transparent layer (28) is **not** removed from the surface of the first medium patterned coating (14).

In contrast to the Reber patent, according to claim 4 of the present invention, after the cavities in a first medium are filled with a second medium, any excess film of the second medium is removed from the surface of the first medium.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP §2131. (Citations omitted) The Reber patent does not disclose or suggest removing any excess second medium from the surface of the first medium once the cavities are filled. Therefore, claim 4 is not anticipated by the Reber patent.

As claims 5-6 depend either directly or indirectly from non-anticipated independent claim 4, they too are not anticipated by the Reber patent.

Further, with respect to claim 5 and claim 6 which depends therefrom, the Reber patent does not disclose that "the first medium has an index of refraction and the second medium has an index of refraction different from the index of refraction of the first medium", nor that "the index of refraction of the second medium is greater than the index of refraction of the first medium". Therefore, claims 5 and 6 would also not be anticipated by the Reber patent independent of claim 4.

Likewise, for similar reasons as discussed with respect to claim 4, claim 10, which requires "removing the resist layer and any excess film of the second medium from the surface of the first medium", is also not anticipated by the Reber patent, as the Reber patent does not disclose or suggest "removing the resist layer and any excess film of the second medium from the surface of the first medium". As claims 11 and 12 depend either directly or indirectly from non-anticipated independent claim 10, they too are not anticipated by the Reber patent.

Further, for similar reasons as those discussed above with respect to claims 5 and 6, claims 11 and 12 are also not anticipated by the Reber patent, without regard to whether or not claim 10 is anticipated by the Reber patent.

Likewise, for similar reasons as discussed with respect to claim 4, claim 13, which requires "removing any excess film of the second medium from the surface of the first medium", is also not anticipated by the Reber patent, as the Reber patent does not disclose or suggest "removing any excess film of the second medium from the surface of the first medium". As claims 14 and 15 depend either directly or indirectly from non-anticipated independent claim 13, they too are not anticipated by the Reber patent.

Further, for similar reasons as those discussed above with respect to claims 5 and 6, claims 14 and 15 are also not anticipated by the Reber patent, without regard to whether or not claim 13 is anticipated by the Reber patent.

Likewise, for similar reasons as discussed with respect to claim 4, claim 16, which requires "removing the resist layer and any excess film of the second medium from the surface of the first medium", is also not anticipated by the Reber patent, as the Reber patent does not disclose or suggest "removing the resist layer and any excess film of the second medium from the surface of the first medium". As claims 17 and 18 depend either directly or indirectly from non-anticipated independent claim 16, they too are not anticipated by the Reber patent.

Further, for similar reasons as those discussed above with respect to claims 5 and 6, claims 17 and 18 are also not anticipated by the Reber patent, without regard to whether or not claim 16 is anticipated by the Reber patent.

Accordingly, it is respectfully requested that the rejection of claims 4-6 and 10-18 under 35 U.S.C. § 102(b) as being fully anticipated by the Reber Patent, be reconsidered and withdrawn.

**35 U.S.C. § 103(a) Rejection**

The rejection of claims 1-3, 7-9 and 19-21 under 35 U.S.C. § 103(a), as being unpatentable over the Reber Patent, in view of the Mersereau Patent, is respectfully traversed based on the following.

Claim 1 as amended requires:

**a first medium having a thickness, the first medium defining a plurality of periodically spaced hollow portions throughout a first layer of the first medium, the hollow portions having a depth less than the thickness of the first medium; and**

**a second medium being dispersed within the hollow portions formed in the first medium,**

**wherein a first layer of the device forms a photonic crystal and includes the first layer of the first medium, and**

**wherein a second layer of the device is formed entirely of the first medium. (Emphasis added)**

That is to say, the optical device of claim 1 is a dual layer optical device formed of a first medium and a second medium. The first layer is formed of the first medium which defines "hollow portions having a depth less than the thickness of the first medium", and a second medium "dispersed within the hollow portions formed in the first medium" such that the "first layer of the device forms a photonic crystal", and where the "second layer of the device is formed entirely of the first medium".

The Reber patent does not disclose or suggest the first layer of the device forming a photonic crystal or a second layer formed entirely of the first medium. Similarly, the

Mersereau patent neither discloses nor suggests a second medium dispersed within the hollow portions of the first medium.

Neither the Reber patent nor the Mersereau patent either alone or in combination disclose or suggest an optical device having **a first medium having a thickness, the first medium defining a plurality of periodically spaced hollow portions throughout a first layer of the first medium, the hollow portions having a depth less than the thickness of the first medium, and a second medium being dispersed within the hollow portions formed in the first medium, wherein a first layer of the device forms a photonic crystal and includes the first layer of the first medium, and wherein a second layer of the device is formed entirely of the first medium.**

Further, there is no suggestion to combine the two references, nor would such a combination provide the device claimed in claim 1 of the present application. Therefore, claim 1 is not obvious with respect to the Reber patent in view of the Mersereau patent.

As claims 2 and 3 depend either directly or indirectly from non-obvious independent claim 1, they too are not obvious with respect to the Reber patent in view of the Mersereau patent.

Further, with respect to claim 2 and claim 3 which depends therefrom, neither the Reber patent nor the Mersereau patent disclose or suggest that "the first medium has an index of refraction and the second medium has an index of refraction different from the index of refraction of the first medium", nor that "the index of refraction of the second medium is greater than the index of refraction of the first medium". Therefore, claims 2 and 3 would also not be obvious with respect to the Reber patent in view of the Mersereau patent independent of claim 1.

Claim 7 as amended is directed to an optical device and requires:

**a first medium having a thickness, the first medium at least partially forming a first layer and a second layer of the optical device, the first layer having a plurality of periodically spaced protruding**

**portions surrounded by hollow portions having a depth less than the thickness of the first medium; and**  
**a second medium being dispersed within the hollow portions surrounding the plurality of periodically spaced protruding portions of the first layer,**  
**wherein the first layer is a photonic crystal, and the second layer is formed entirely of the first medium. (Emphasis added)**

The Reber patent does not disclose or suggest the first layer of the device forming a photonic crystal or a second layer formed entirely of the first medium. The Mersereau patent neither discloses nor suggests a second medium dispersed within the hollow portions of the first medium.

Neither the Reber patent nor the Mersereau patent either alone or in combination disclose or suggest an optical device having **a first medium having a thickness, the first medium at least partially forming a first layer and a second layer of the optical device, the first layer having a plurality of periodically spaced protruding portions surrounded by hollow portions having a depth less than the thickness of the first medium, and a second medium being dispersed within the hollow portions surrounding the plurality of periodically spaced protruding portions of the first layer, wherein the first layer is a photonic crystal, and the second layer is formed entirely of the first medium.**

Further, there is no suggestion to combine the two references, nor would such a combination provide the device claimed in claim 7 of the present application. Therefore, claim 7 is not obvious with respect to the Reber patent in view of the Mersereau patent.

As claims 8 and 9 depend either directly or indirectly from non-obvious independent claim 7, they too are not obvious with respect to the Reber patent in view of the Mersereau patent.

Further, with respect to claim 8 and claim 9 which depends therefrom, neither the Reber patent nor the Mersereau patent disclose or suggest that "the first medium has an index of refraction and the second medium has an index of refraction different from the

index of refraction of the first medium", nor that "the index of refraction of the second medium is greater than the index of refraction of the first medium". Therefore, claims 8 and 9 would also not be obvious with respect to the Reber patent in view of the Mersereau patent independent of claim 7.

Claim 19 is directed to an optical device and requires:

**a first medium having a thickness, the first medium at least partially forming a first layer and a second layer of the optical device, the first layer defining a plurality of periodically spaced hollow portions, the hollow portions having a depth less than the thickness of the first medium; and**

**a second medium being dispersed within the hollow portions, wherein the first layer of the optical device forms a photonic crystal, and**

**wherein the second layer of the device is formed at least partially of the first medium. (Emphasis added)**

The Reber patent does not disclose or suggest the first layer of the device forming a photonic crystal or a second layer formed entirely of the first medium. The Mersereau patent neither discloses nor suggests a second medium dispersed within the hollow portions of the first medium.

Neither the Reber patent nor the Mersereau patent either alone or in combination disclose or suggest an optical device having **a first medium having a thickness, the first medium at least partially forming a first layer and a second layer of the optical device, the first layer defining a plurality of periodically spaced hollow portions, the hollow portions having a depth less than the thickness of the first medium, and a second medium being dispersed within the hollow portions, wherein the first layer of the optical device forms a photonic crystal, and wherein the second layer of the device is formed at least partially of the first medium.**

Further, there is no suggestion to combine the two references, nor would such a combination provide the device claimed in claim 19 of the present application. Therefore, claim 19 is not obvious with respect to the Reber patent in view of the Mersereau patent.



As claims 20 and 21 depend either directly or indirectly from non-obvious independent claim 19, they too are not obvious with respect to the Reber patent in view of the Mersereau patent.

Further, with respect to claim 20 and claim 21 which depends therefrom, neither the Reber patent nor the Mersereau patent disclose or suggest that "the first medium has an index of refraction and the second medium has an index of refraction different from the index of refraction of the first medium", nor that "the index of refraction of the second medium is greater than the index of refraction of the first medium". Therefore, claims 20 and 21 would also not be obvious with respect to the Reber patent in view of the Mersereau patent independent of claim 19.

Accordingly, it is respectfully requested that the rejection of claims 1-3, 7-9 and 19-21 under 35 U.S.C. § 103(a) as being unpatentable over the Reber Patent, in view of the Mersereau Patent, be reconsidered and withdrawn.

### CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

By: Kathy Needleman  
Kathy E. Needleman  
Registration No. 47,816  
Attorney for Applicant

KEN/rb:bar:jkk  
SIDLEY AUSTIN BROWN & WOOD LLP  
717 N. Harwood, Suite 3400  
Dallas, Texas 75201  
Direct: (214) 981-3474  
Main: (214) 981-3300  
Facsimile: (214) 981-3400  
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**APPENDIX**

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

The following is a marked-up version of the changes to the claims which are being made in the attached response to the Office Action dated September 11, 2002.

**IN THE CLAIMS:**

1. (Once Amended) An optical device comprising:
  - a first medium having a thickness, the first medium defining a plurality of periodically spaced [concave] hollow portions throughout a first layer of the first medium, the [concave] hollow portions having a depth less than the thickness of the first medium; and
  - a second medium being dispersed within the [concave] hollow portions formed in the first medium,
  - wherein a first layer of the device forms a photonic crystal and includes the first layer of the first medium, and
  - wherein a second layer of the device is formed entirely of the first medium.
  
7. (Once Amended) An optical device comprising:
  - a first medium having a thickness, the first medium at least partially forming a first layer and a second layer of the optical device, the first layer having a plurality of periodically spaced protruding portions surrounded by [concave] hollow portions having a depth less than the thickness of the first medium; and
  - a second medium being dispersed within the [concave] hollow portions surrounding the plurality of periodically spaced protruding portions of the first layer,
  - wherein the first layer is a photonic crystal, and the second layer is formed entirely of the first medium.

19. (Once Amended) An optical device comprising:

a first medium having a thickness, the first medium at least partially forming a first layer and a second layer of the optical device, the first layer defining a plurality of periodically spaced [concave] hollow portions, the [concave] hollow portions having a depth less than the thickness of the first medium; and

a second medium being dispersed within the [concave] hollow portions, wherein the first layer of the optical device forms a photonic crystal, and wherein the second layer of the device is formed at least partially of the first medium.